# Review of: "On the Vapour Pressure Over Three-Component Solutions"

Muhammad Taj[1]

1 Mathematics, Azad Jammu and Kashmir University, Pakistan

Potential competing interests: No potential competing interests to declare.

Title: “On the vapour pressure over three-component solutions”

The article focuses on generalizing equations that describe the vapour pressure of components in binary solutions to three-component solutions. The approach links partial vapour pressures to Henry constants and second virial coefficients, attempting to predict behaviour in ternary systems. The author initially presents the equations related to binary solutions and aims to extend these formulations to three-component (ternary) systems. It describes the development of the equations for three-component solutions, involving mole fractions and the calculation of partial vapour pressures using polynomial representations. The document generalizes previously derived equations and applies them to three binary solutions that form the ternary system. After careful evaluation of this study, I found that this work has the potential to be published in this journal, but after responding to the major revision.

The authors need to revise the manuscript, keeping in mind the following points:

1. The paper assumes the applicability of Henry’s law and virial coefficients. However, it may be useful to ask the authors to clarify any assumptions they make about the limits of validity of the equations, especially concerning the applicability to systems where deviations from ideality may be substantial.
2. While the article is highly mathematical, it may benefit from additional numerical examples or case studies to show how the generalized equations are applied to real-world solutions.
3. It is unclear whether the author validates the generalization with experimental data or compares the theoretical results with actual measurements. It may be useful to ask for experimental confirmation or references to such validations.
4. The document references a Roseboom triangle (Fig. 1), but additional graphical or tabular representation of the results and how the equations relate to real systems could enhance clarity.
5. The generalization of equations to three-component solutions provides a novel approach. However, further validation or numerical illustrations may be required for a stronger impact.
6. While the mathematical formulation is comprehensive, it could benefit from more detailed explanations or expanded discussion sections to make the article more accessible to a broader audience.
7. A comparison with existing models or experimental results would strengthen the paper.
8. In the revised version, grammatical and spacing mistakes should be removed.